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Rodger, Sylvia; Mickan, Sharon; Marinac, Julie; Woodyatt, Gail

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RESEARCH NOTES

▲ Enhancing Teamwork among Allied Health Students: Evaluation of an Interprofessional Workshop

Sylvia Rodger, B Occ Thy, M Ed St, PhD

Sharon Mickan, B Occ Thy, MA, PhD

Julie Marinac, B Sp Path (Hons), PhD

Gail Woodyatt, B Sp Thy, PhD

This report outlines the teamwork learning outcomes of an interprofessional workshop conducted with a cohort of 81 graduate-entry students of occupational therapy, physiotherapy, speech pathology, and audiology. This four-hour workshop was based around a case scenario of a child with developmental coordination disorder. This report describes and evaluates the development of knowledge and skills of teamwork that were facilitated through this workshop. Students completed questionnaires before and after the workshop about their knowledge of teamwork, requisites for working together, the utility of the workshop, and learning outcomes. The evaluation indicated that the workshop was successful from the students' perspectives in confirming the importance of teamwork and the processes of communication and collaborative goal setting. Students refined their own professional roles and developed an appreciation of the contribution of other professions and parents. This recognition of the comparative value of different professional contributions in providing holistic patient care is one of the starting points for education about interprofessional teamwork. *J Allied Health* 2005; 34:230–235.

WITH THE INCREASING PREVALENCE of teamwork in health care settings, health professional students need to learn how to be effective and contributing team members.¹ It is widely advocated that learning together enhances the abilities of different professionals to work together.^{2–4} In support, there is clear research evidence that student health professionals reported changes in their knowledge, skills, attitudes, and beliefs following interdisciplinary education experi-

Dr. Rodger and **Dr. Woodyatt** are Senior Lecturers and **Dr. Marinac** is Lecturer at the Children's Research Unit: Communication, Occupation, and Movement, CRU.COM, School of Health and Rehabilitation Sciences, University of Queensland, Brisbane, Queensland, Australia; and **Dr. Mickan** is Senior Organisational Development Consultant, Mater Education Centre, Mater Health Services, Brisbane, Queensland, Australia.

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Address correspondence and reprint requests to: Sylvia Rodger, B Occ Thy, M Ed St, PhD, Division of Occupational Therapy, School of Health and Rehabilitation Sciences, University of Queensland, Brisbane, Queensland, Australia 4072. Tel 61-7-3365-1664; fax 61-7-3365-1662; e-mail: s.rodger@uq.edu.au.

ences.^{1,5} Students enhanced their understanding of professional roles, recognized that some professions held different perceptions than their own, and experienced collaborative problem solving. As students learned about clinical experiences together with other students from related professions, they achieved better individual and shared understandings of clinical and team skills that were not possible using traditional didactic methods of education.⁶ Students were also exposed to and given opportunities to practice some of the teamwork skills that were required in clinical practice.⁷

In contrast, traditionally few health professionals are taught teamwork skills.⁸ This may be because there are many pragmatic difficulties in organizing shared learning opportunities across different curricula and timetables. Further, health care professions prioritize aspects of teamwork differently, making agreement on taught content challenging. At a conceptual level, there is a wide range of acknowledged characteristics of effective health care teams.⁹ There is also a recognized continuum of collaborative practice from multidisciplinary through interdisciplinary to transdisciplinary teamwork. There is a corresponding increase in the time required for and complexity of coordination within these different types of teams.¹⁰ At a more individual level, professional groups have different interpretations of teamwork.¹¹ The way in which professional groups believe they should work together impacts on their interpretations and implementation of teamwork. Individual philosophies of teamwork are instrumental in shaping perceptions of team function, such as the need for a shared vision, beliefs about what constitutes effective communication, practical methods of valuing other's roles, and expectations of learning from other professionals.

There is increasing consensus that an understanding of the fundamental aspects of teamwork needs to be incorporated into basic professional education. At the start of their preregistration education, there is some evidence that health care students identify strongly with their own professional group and that they are willing to engage in interprofessional learning.¹² However, it is commonly assumed that students need to have an understanding of their professional behaviors and expectations before they can appreciate the contributions of other professionals.^{11,13} Despite these subtle differences, there is agreement that interprofessional educa-

tion is important for health care students to capitalize on positive attitudes toward their own and other professional groups and to minimize negative professional stereotypes.¹²

It is important for education to address the processes of teamwork. Profession-specific beliefs need to be challenged and discussed to negotiate a broader understanding of teamwork. Common interprofessional educational approaches incorporate learning clinical and team-based communication skills around a patient scenario using experienced interprofessional team teachers.^{11,13} Case-based interprofessional learning enables students to understand patient care from their own perspective and from the perspective of other professionals. Understanding the holistic care required by a patient and the interdependency of practice are key organizing principles.^{10,13} Through open discussion in a safe learning environment, students can develop an understanding of the expertise of other professionals and their rationales for intervention in managing complex patient care. Further, problems and issues are commonly used to stimulate learning and emphasize interaction and problem solving.³ A coaching model of experiential learning has been demonstrated to enhance student satisfaction, to assist students to learn from each other, and to facilitate the transfer of learning to other teams.¹⁴

Context

Members of the Children's Research Unit: Communication, Occupation and Movement (CRU.COM), based in the School of Health and Rehabilitation Sciences at the University of Queensland, received funding to develop and pilot a multiprofessional student learning experience. These academics and researchers from occupational therapy, physiotherapy, and speech pathology professions developed, piloted, and conducted workshops for graduate-entry allied health students that were focused on teamwork for children with developmental coordination disorder (DCD). Children with DCD have complex needs that require the expertise of many professions. These children are frequently seen by therapists in community-based pediatric clinics, private practices, and school settings. A team approach is increasingly important for this type of chronic health care problem. Increasingly, it is recognized that multifaceted health problems are too complex to be addressed by a single profession.⁶ Long-term management of chronic conditions requires team members to use their unique individual skills and to cooperate with other equally skilled professionals to coordinate optimal care that incorporates the patient's preferences and abilities. Previous research on interdisciplinary education projects has focused on geriatrics and rural health¹⁵ rather than pediatrics, which was the focus of this workshop experience.

These interprofessional workshops were designed to enhance students' knowledge and skills in managing children with DCD, together with the teamwork skills of communication and problem solving. Generally, these allied

health students had limited exposure to, knowledge about, and experiences of teamwork. Although some students had worked in teams as part of their fieldwork placements, clinical educators frequently requested better preparation about the realities of teamwork in clinical practice.

A detailed description of the development of the workshop and the roles of different professionals in managing these children and their families has been reported elsewhere.¹⁶ The current report focuses on describing and evaluating the development of knowledge and skills of teamwork that were facilitated through this workshop.

Workshop Format

A four-hour workshop was designed to facilitate participation and group interaction while learning about clinical interventions for children with DCD and their families. Principles of adult learning and experiential learning as well as problem-solving approaches were incorporated into the workshop design through a focus on a clinical case study.^{17,18} A case-based approach was chosen to facilitate students to understand the principles of holistic care and the interdependency of practice.^{12,14} Through open discussion of the patient's problems and issues, students were encouraged to discriminate between their own contributions and those of other professionals.³ A video was chosen to highlight the way in which different professionals worked with a child with DCD. The video included segments of an interview with the child's mother and assessments by an occupational therapist, a physiotherapist, and a speech pathologist. This video conveyed the complex and practical difficulties of managing a child with DCD and reinforced the need for teamwork, including collaborative problem solving through the necessary and complementary contributions of different professional groups.

A pilot workshop was first conducted with 10 final-year undergraduate students to investigate and confirm the optimal format for this workshop.

Methods

PARTICIPANTS

Eighty-one of the entire cohort of 87 second-year graduate-entry master's-degree students based in Brisbane in occupational therapy, speech pathology, physiotherapy, and audiology participated in nine compulsory 4-hour workshops. Six students did not attend because they were based in rural or regional locations. They were provided with an alternative interprofessional education experience in their rural settings. These students participated in this workshop halfway through their professional education (two-year, six-semester fast-tracked programs). They had already identified strongly with their own professional group, and this was emphasized as a starting point for understanding the contributions of other professionals.^{11,13} However, the workshop was also

designed to promote positive attitudes toward their allied health peers before engagement in extended fieldwork.¹²

FACILITATORS AND WORKSHOP

Seven experienced educators and clinicians were trained as workshop facilitators by two CRU.COM members who had facilitated the pilot workshop. Facilitators were familiarized with the aims of the workshop and skills in group process facilitation. Facilitators role modeled an interdisciplinary team process where all participants were encouraged to listen respectfully to each other and to ask questions of and discuss issues with each other rather than relying on workshop facilitators to direct the interaction. All facilitators watched the entire video to understand the profession-specific explanations for the assessments undertaken. To maintain consistency, facilitators were given a package of informative handouts and PowerPoint slides that formed the basis of the workshop. Client case history and assessment reports were included.

EVALUATION INSTRUMENTS

Students individually completed purpose-designed pre-workshop and postworkshop questionnaires. The two questionnaires were developed by the authors, reviewed by two academic peers with respect to face validity, and piloted with 10 students from three professions. Both questionnaires contained nine open-ended questions asking students to outline their knowledge about DCD and their understanding of the role of their own profession, other professions, teachers, and parents in managing a child with DCD. In addition, questions addressed their perceptions of the meaning, importance, and prerequisites for teamwork. For example, students were asked, "What does teamwork mean to you?," "Why is teamwork necessary when working with these children?," and "What are the important requisites for effective teamwork?" The postworkshop questionnaire contained six additional questions that required students to evaluate their learning during the workshop, reflect on the strengths of the workshop, and recommend any changes. This included three Likert-scale questions that focused on evaluating aspects of the video and content of the workshop. For example, students were asked, "What are the key things you have learned from this workshop?" and "What did you learn about teamwork from this workshop?" The similarity of the prequestionnaire and postquestionnaire promoted reliable and consistent content comparisons. This report focuses on the preworkshop and postworkshop questions pertaining to teamwork only.

DATA ANALYSIS

In total, 72 sets of prequestionnaires and postquestionnaires were returned (89% response rate). Responses were analyzed descriptively and grouped by content similarity¹⁹ by one author (J.M.). Content themes were independently

audited by another author (S.R.) and confirmed through discussion. Trustworthiness¹⁹ was ensured by addressing (1) credibility through peer examination of the open-ended questionnaire responses, (2) transferability through describing the sample of students involved, and (3) dependability by peer examination and audit of questionnaires against content themes by a second author, as well as coding/recoding of a subset of the questionnaires by the first author. The range and frequency of responses for each question were tabulated. For each open-ended question, students were able to provide multiple comments or responses; hence, some percentages reported add up to more than 100%. The most frequently reported responses to each question are presented and descriptively analyzed.

To evaluate gains in student learning, responses were further categorized and interpreted according to Kirkpatrick's four developmental stages of education evaluation, where each stage reflects an increasing level of complexity in behavioral change following education.²⁰

Results

PRIOR KNOWLEDGE OF TEAMWORK

Students' responses to the preworkshop questionnaire reflected a basic knowledge of teamwork that was reactive to the needs of the child (see Table 1). More than half of the students responded that "teamwork is working together in a team." Almost half of the students recognized the need for team members to share a similar goal. One fifth of students reported that a team would better meet the needs of children as opposed to treatment by a single health care professional. Only small numbers (less than one fifth) of students identified comparatively deeper concepts of cooperation, multiskilling, and communication as being important facets of teamwork.

Two thirds of students considered that DCD was a "multidisciplinary disorder." This reflected comments that the complexity of the condition required an interdisciplinary team approach due to the number of professionals who had a role in managing these children. However, they were nonspecific about the application of this approach. Instead, they referred to and anticipated greater treatment efficacy as a consequence of teamwork and emphasized a need "to work together" to support their own knowledge base about the condition.

More than half of the student participants emphasized the importance of communication as a requisite for teamwork. Approximately one fourth of students recognized the importance of commonly acknowledged team processes of "cooperation," "team spirit," and "having a common goal." Less than one fourth of students recognized individual traits such as "open-mindedness," a "willingness to listen," and "respect" for other team members.

WORKSHOP AS A TEAMWORK LEARNING EXPERIENCE

Having completed the interprofessional workshop, more than half of the students reported their most significant

TABLE 1. Most Frequent Responses to the Preworkshop Questionnaire Regarding Teamwork

Question	Most Frequent Responses	
	(in students' own words)	No. %
What does teamwork mean to you?	Working together in a team	42 58
	Having a similar goal	31 43
	The child's needs will be better met	15 21
	Multiskilled professionals	14 19
	Cooperation between members	10 14
Why is teamwork necessary when working with these children?	Communication	9 13
	Multidisciplinary disorder	47 65
	Greater efficacy attained	11 15
What do you think are important requisites for effective teamwork?	Need to work together	7 10
	Communication	38 53
	Cooperation	21 29
	Team spirit	18 25
	Open-mindedness	16 22
	Listening	16 22
	Respect	15 21
	Having a common goal	10 14

Note. Responses are given as the number and percentage of the total number of student responses ($n = 72$). Because students were able to provide multiple responses to open-ended questions, these percentages may add up to more than 100%.

learning as relating to their understanding of the roles of different professionals when working with children with DCD. Less frequently, students recognized an increased knowledge of the clinical condition of DCD and the range of assessment tools available. There was recognition of the "need for professional teamwork" for children with complex conditions. In addition, less than one fifth of students believed they had learned the skills to "work in interprofessional teams" (see Table 2).

Almost half of the students acknowledged that the workshop enhanced their understanding of their own profession's role. Students were specifically asked to distinguish between how the workshop clarified their own profession's role and the roles of other professions in working with children with DCD. While student responses were similar to both questions, it appears that they initially recognized the benefits of clarifying their own professional role. Interestingly, it appears that, through clarifying their own roles, students better understood the roles of other professions.

Student participants offered similar responses to the preworkshop questionnaire in relation to understanding teamwork processes and individual skills. After the workshop, approximately one third of the students described learning about teamwork in terms of a better understanding of the "need for communication and listening." Similarly, less than one fifth of the students referred to teamwork processes of a "common goal," "a holistic approach to patient care," and "knowledge of different team roles."

Students indicated the main strength of the workshop as the "multidisciplinary approach." They commented specifically about the active participation of students from four professions in a workshop about a complex childhood condition. Viewing the video illustrated assessments from all

the professions that promoted deeper understanding of their own roles and a greater appreciation of the contributions of other professionals and parents. Students valued the style of facilitation, which encouraged open discussion and problem solving. They appreciated opportunities to interact and discuss with each other, observe videos, and share new knowledge.

Discussion

It appears that students developed a different emphasis in their understanding of the importance and application of teamwork following the workshop. Before the workshop, students described a superficial understanding of the need to work together in response to the complexity of the child's disorder. They had an understanding that teamwork was important and could enhance treatment efficacy; however, they had a limited cognizance of the essential team processes and individual skills required. After the workshop, the students' preworkshop superficial perceptions of the importance of teamwork were confirmed. Some students were able to recognize key teamwork processes and individual skills, namely communication, having a common goal, and a holistic approach. At a deeper level, students were able to understand and describe the role of their own profession in the team. Although they found it difficult to differentiate the roles of other professionals, they did acknowledge that through self-referencing and understanding the contributions of their own profession, they could better understand the potential roles of other professions. The contributions of different professionals were clarified for the students through video observation of the range of profession-specific assessments with the child.

TABLE 2. Most Frequent Responses to the Postworkshop Questionnaire: Students' Perceptions of Professional Roles and Teamwork

Question	Most Frequent Responses (in students' own words)	No.	%
What are the key things you have learned from this workshop?	Each profession's role in DCD	45	60
	Knowledge of DCD	33	44
	Need for interprofessional teamwork	28	38
	Knowledge of other assessment tools	12	16
	How to work in interprofessional teams	10	13
How have you clarified your professional role in working with children with DCD?	Definition of own role in team	22	29
	Other professional roles defined	12	16
	Assessments for DCD clarified	12	16
	Knowledge of DCD extended	12	16
How have you understood the role of other professions when working with children with DCD?	Professional role knowledge enhanced	33	44
	Aware of other's assessments through video	26	25
	Better role definition	14	19
What did you learn about teamwork from this workshop?	Need for communication and listening	27	36
	Importance of teamwork	16	21
	Need for a common goal	11	15
	Holistic approach to patient care	11	15
	Knowledge of different roles	10	13
What were the strengths of this workshop?	Interdisciplinary approach	31	41
	Video evidence format	12	16
	Overall content and presentation	19	25
	Role insights	8	11

Note. Responses are given as the number and percentage of the total number of student responses ($n = 72$). Because students were able to provide multiple responses to open ended questions, these percentages may add up to more than 100%. (DCD, developmental coordination disorder.)

Students commented that observing the detail and focus of assessment helped them to understand the practical contributions of each profession. Comparative analysis of profession-specific assessments confirmed the role-specific observations of the students. By observing the assessments of all the professions, students were able to formulate a comprehensive picture of the child's strengths and weaknesses. These findings also support the literature regarding the usefulness of case-based scenarios to understand the interdependence of professional practice.^{10,13}

At a higher level of evaluation of student learning, Kirkpatrick's four developmental stages of education evaluation (reaction, learning, behavior, and results) were used as a framework for categorizing educational outcomes.²⁰ Similar to other studies,^{1,3} this project evaluated educational outcomes to be predominantly in the first two stages of reaction and learning (see Table 3). At the first developmental level of reaction, students were able to evaluate the learning experience constructively. They appreciated the interdisciplinary approach, the use of a video case scenario, and the method of process facilitation used in this workshop. This was significantly different from their usual learning experiences, and it prompted greater levels of constructive discussion and collaborative problem solving around issues of patient care. This style of facilitation enhanced students' abilities to understand the perspectives of their own profession and those of other professions, as described by Johnston and Banks.³

At the second level of learning, students described enhanced knowledge, skills, and attitudes.^{5,8} They reported increased knowledge of the condition of DCD as well as their own role and the roles of others in assessment and intervention. Students acknowledged the positive experience of teamwork skills in communication and collaborative goal setting. After the workshop, students described positive expectations about the benefits of interprofessional teamwork for children with complex conditions. They described the ability of the team to integrate the care of different professionals toward common child-centered goals in a more holistic manner. This learning appeared to have engendered students' enthusiasm for engaging in interprofessional teamwork in the future.

It was beyond the scope and time available for this learning experience to expect that a four-hour workshop could be evaluated in terms of students' behavior changes in this or in other environments. However, it is anticipated that through a better understanding of their own role and the roles of others, student professionals will develop a realistic level of respect for their colleagues that will facilitate their future teamwork experiences. The potential for positively biased responses needs to be verified in a longitudinal research project during and beyond their graduate study. Future research could consider whether interprofessional learning experiences such as this workshop have a long-term impact on professional behavior in clinical settings.

TABLE 3. Hierarchical Levels of Evaluation of Interprofessional Education

Evaluation Level	Description	Student Responses
Reaction	Participants able to evaluate the learning experience constructively	Interdisciplinary approach to workshop Overall content, presentation, and format (e.g., use of video) Insights into own professional roles and the professional roles of others
Learning	Enhanced student knowledge, attitudes, beliefs, and skills	Define their own roles and the roles of others in DCD Knowledge of condition of DCD Importance of communication and collaboration Knowledge of assessment tools for DCD Need for a common goal Importance of interprofessional teams How to work in teams Holistic approach to client care
Behavior	Enhanced individual practice through experiential learning	Not applicable
Results	Transfer of knowledge skills to other learning environments	Not applicable

Table adapted from Kirkpatrick.²⁰ (DCD, developmental coordination disorder.)

Students' positive perceptions of the importance of teamwork would be expected to influence their future participation in teams. However, this short workshop has not been able to equip students with a deeper understanding or sufficient skills in effective teamwork. Further education is required to expand students' understanding of teamwork, promote the development of additional skills, and maintain and reinforce these emergent positive attitudes.

Conclusions

This paper reports on a successful interprofessional workshop for allied health students. Improvements in students' knowledge about a clinical condition and their knowledge, skills, and attitudes about teamwork were described and were found to be consistent with the literature. Students recognized the importance of teamwork and the value of teamwork processes of communication and collaborative goal setting. Students confirmed their own professional roles in the team and began to understand the comparative contributions of other allied health professionals in relation to a child with DCD. This recognition of the value of diversity in holistic patient care is one starting point for further education about interprofessional teamwork.

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